

IN THE CLAIMS

Please cancel non-elected claims 187, 191 and 194 without prejudice.

2) ~~142.~~ (amended) An oligomer of claim ~~141~~ wherein R^2 , R^{2*} , R^3 , and R^{3*} not designating P^* each designates a biradical consisting of 1-8 groups or atoms selected from - $C(R^aR^b)-$, $-C(R^a)=C(R^a)-$, $-O-$, and $>C=Z$.

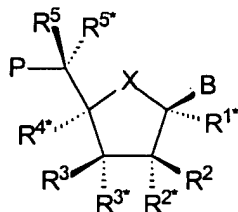
E2 3) ~~143.~~ (amended) An oligomer of claim ~~141~~ wherein the one or two pairs of non-geminal substituents, constituting one or two biradical(s), respectively, are selected from the present substituents of R^{1*} , R^{4*} , R^6 , R^{6*} , R^7 , R^{7*} , R^N , and the ones of R^2 , R^{2*} , R^3 , and R^{3*} not designating P^* .

4) ~~144.~~ (amended) An oligomer of claim ~~141~~ wherein the oligomer comprises 1 to 10000 nucleosides of the formula I and 0-10000 nucleosides selected from naturally occurring nucleosides and nucleoside analogues, with the proviso that the sum of the number of nucleosides and the number of LNA(s) is at least 2.

5) ~~145.~~ (amended) An oligomer of claim ~~144~~ wherein at least one LNA nucleoside comprises a nucleobase as the substituent B.

6) ~~146.~~ (amended) An oligomer of claim ~~141~~ wherein one of the substituents R^3 and R^{3*} designates P^* .

7) ~~147.~~ (amended) An oligomer of ~~141~~ wherein one or more nucleosides have the following formula Ia



1a

wherein P, P*, B, X, R1*, R2, R2*, R3, R4*, R5, and R5* are as defined in claim 141.

8 148. (amended) An oligomer of claim 147 wherein R3* designates P*.

9 149. (amended) An oligomer of claim 148 wherein the oligomer comprises one biradical constituted by two non-geminal substituents.

E2 10 150. (amended) An oligomer of claim 141 wherein X is selected from -(CR6R6*)-, -O-, -S-, and -N(RN*)-.

11 151. (amended) An oligomer of claim 141 wherein the biradical(s) constituted by pair(s) of non-geminal substituents is/are selected from -(CR*R*)_r-O-(CR*R*)_s-, -(CR*R*)_r-O-(CR*R*)_s-O-, -O-(CR*R*)_{r+s}-O-, -O-(CR*R*)_r-O-(CR*R*)_s-, and -O-, wherein each R* is independently selected from hydrogen, halogen, azido, cyano, nitro, hydroxy, mercapto, amino, mono- or di(C₁₋₆-alkyl)amino, optionally substituted C₁₋₆-alkoxy, optionally substituted C₁₋₆-alkyl, DNA intercalators, photochemically active groups, thermochemically active groups, chelating groups, reporter groups, and ligands, and/or two adjacent (non-geminal) R* may together designate a double bond, and each of r and s is 0-4 with the proviso that the sum r+s is 1-5.

12 152. (amended) An oligomer of claim 151 wherein each biradical is independently selected from -O-, -(CR*R*)_r-O-(CR*R*)_s-, and -O-(CR*R*)_{r+s}-O-, wherein and each of r and s is 0-3 with the proviso that the sum r+s is 1-4.

13 153. (amended) An oligomer of claim 141 wherein one of the following criteria applies for at least one LNA nucleoside:

- (i) R^{2*} and R^{4*} together designate a biradical selected from $-O-$, $-(CR^*R^*)_r-O-(CR^*R^*)_s-$, $O-(CR^*R^*)_{r+s}-O-$, $-S-(CR^*R^*)_{r+s}-O-$, $-O-(CR^*R^*)_{r+s}-S-$, $-N(R^*)-(CR^*R^*)_{r+s}-O-$, and $-O-(CR^*R^*)_{r+s}-N(R^*)-$;
- (ii) R^2 and R^3 together designate a biradical selected from $-O-$ and $-(CR^*R^*)_r-O-(CR^*R^*)_s-$;
- (iii) R^{2*} and R^3 together designate a biradical selected from $-O-$ and $-(CR^*R^*)_r-O-(CR^*R^*)_s-$;
- (iv) R^3 and R^{4*} together designate a biradical of $-(CR^*R^*)_r-O-(CR^*R^*)_s-$;
- (v) R^3 and R^5 together designate a biradical of $-(CR^*R^*)_r-O-(CR^*R^*)_s-$; or
- (vi) R^{1*} and R^{4*} together designate a biradical of $-(CR^*R^*)_r-O-(CR^*R^*)_s-$;
- (vii) R^{1*} and R^{2*} together designate a biradical of $-(CR^*R^*)_r-O-(CR^*R^*)_s-$;

wherein each of r and s is 0-3 with the proviso that the sum $r+s$ is 1-4, and where X is selected from $-O-$, $-S-$, and $-N(R^H)-$ where R^H designates hydrogen or C_{1-4} -alkyl.

14 154. (amended) An oligomer of claim 153 wherein R^{3*} designates P^* .

15 155. (amended) An oligomer of claim 154 wherein R^{2*} and R^{4*} together designate a biradical.

16 156. (amended) An oligomer of claim 155 wherein X is O , R^2 is selected from hydrogen, hydroxy, and optionally substituted C_{1-6} -alkoxy, and R^{1*} , R^3 , R^5 , and R^{5*} designate hydrogen.

17 ~~157~~. (amended) ¹⁶ An oligomer of claim ~~156~~ wherein the biradical is selected from -
O- and $-(CH_2)_{0-1}-O-(CH_2)_{1-3}-$.

18 ~~158~~. (amended) ¹⁷ An oligomer of claim ~~157~~ wherein the biradical is $-O-CH_2-$.

19 ~~159~~. (amended) ¹⁵ An oligomer of claim ~~155~~ wherein B is selected from nucleobases.

20 ~~160~~. (amended) ¹⁹ An oligomer of claim ~~159~~ wherein the oligomer comprises at least
one LNA nucleoside wherein B is selected from adenine and guanine and at least one LNA
nucleoside wherein B is selected from thymine, cytosine and urasil.

E2 21 ~~161~~. (amended) ¹⁴ An oligomer of claim ~~154~~ wherein R^2 and R^3 together designate a
biradical.

22 ~~162~~. (amended) ²¹ An oligomer of claim ~~161~~ wherein X is O, R^{2*} is selected from
hydrogen, hydroxy, and optionally substituted C_{1-6} -alkoxy, and R^{1*} , R^{4*} , R^5 , and R^{5*} designate
hydrogen.

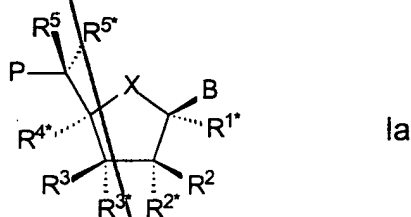
23 ~~163~~. (amended) ²² An oligomer of claim ~~162~~ wherein the biradical is $-(CH_2)_{0-1}-$
 $O-(CH_2)_{1-3}-$.

24 ~~164~~. (amended) ¹⁴ An oligomer of claim ~~154~~ wherein one R^* is selected from
hydrogen, hydroxy, optionally substituted C_{1-6} -alkoxy, optionally substituted C_{1-6} -alkyl, DNA
intercalators, photochemically active groups, thermochemically active groups, chelating groups,
reporter groups, and ligands, and any remaining substituents R^* are hydrogen.

25 ~~165~~. (amended) ¹⁴ An oligomer of claim ~~154~~ wherein a group R^* in the biradical of at
least one LNA nucleoside is selected from DNA intercalators, photochemically active groups,

thermochemically active groups, chelating groups, reporter groups, and ligands.

~~26~~ 166. (amended) An oligomer according to claim ~~154~~ ¹⁴ wherein one or more LNA nucleosides correspond to the formula Ia:



wherein X is -O-;

E2 B is selected from nucleobases, DNA intercalators, photochemically active groups, thermochemically active groups, chelating groups, reporter groups, and ligands;

P designates the radical position for an internucleoside linkage to a succeeding monomer, or a 5'-terminal group, such internucleoside linkage or 5'-terminal group optionally including the substituent R⁵;

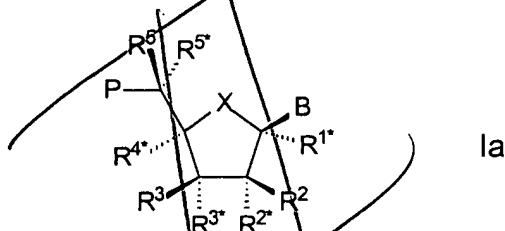
R^{3*} is a group P* which designates an internucleoside linkage to a preceding monomer, or a 3'-terminal group;

R^{2*} and R^{4*} together designate a biradical selected from -O-, -(CR^{*}R^{*})_r-O-(CR^{*}R^{*})_s- and -O-; wherein each R^{*} is independently selected from hydrogen, halogen, azido, cyano, nitro, hydroxy, mercapto, amino, mono- or di(C₁₋₆-alkyl)amino, optionally substituted C₁₋₆-alkoxy, optionally substituted C₁₋₆-alkyl, DNA intercalators, photochemically active groups, thermochemically active groups, chelating groups, reporter groups, and ligands, and/or two adjacent (non-geminal) R^{*} may together designate a double bond, and each of r and s is 0-3 with the proviso that the sum

$r+s$ is 1-4; each of the substituents R^{1*} , R^2 , R^3 , R^5 , and R^{5*} is independently selected from hydrogen, optionally substituted C_{1-6} -alkyl, optionally substituted C_{2-6} -alkenyl, hydroxy, C_{1-6} -alkoxy, C_{2-6} -alkenyloxy, carboxy, C_{1-6} -alkoxycarbonyl, C_{1-6} -alkylcarbonyl, formyl, amino, mono- and di(C_{1-6} -alkyl)amino, carbamoyl, mono- and di(C_{1-6} -alkyl)-amino-carbonyl, C_{1-6} -alkyl-carbonylamino, carbamido, azido, C_{1-6} -alkanoyloxy, sulphono, sulphonyl, C_{1-6} -alkylthio, DNA intercalators, photochemically active groups, thermochemically active groups, chelating groups, reporter groups, and ligands, and halogen, where two geminal substituents together may designate oxo;

and basic salts and acid addition salts thereof.

E2 27 167. (amended) An oligomer of claim 14/1 wherein one or more LNA nucleosides correspond to the formula Ia:



wherein X is -O-;

B is selected from nucleobases, DNA intercalators, photochemically active groups, thermochemically active groups, chelating groups, reporter groups, and ligands;

P designates the radical position for an internucleoside linkage to a succeeding monomer, or a 5'-terminal group, such internucleoside linkage or 5'-terminal group optionally including the substituent R^5 ;

R^{3*} is a group P^* which designates an internucleoside linkage to a preceding monomer, or a 3'-

terminal group;

E2
R^{2*} and R^{4*} together designate a biradical selected from $-(CR^*R^*)_r-O-(CR^*R^*)_s-$ and $-O-$, wherein each R^{*} is independently selected from hydrogen, halogen, azido, cyano, nitro, hydroxy, mercapto, amino, mono- or di(C₁₋₆-alkyl)amino, optionally substituted C₁₋₆-alkoxy, optionally substituted C₁₋₆-alkyl, DNA intercalators, photochemically active groups, thermochemically active groups, chelating groups, reporter groups, and ligands, and/or two adjacent (non-geminal) R^{*} may together designate a double bond, and each of r and s is 0-3 with the proviso that the sum r+s is 1-4; each of the substituents R^{1*}, R², R³, R⁵, and R^{5*} is independently selected from hydrogen, optionally substituted C₁₋₆-alkyl, optionally substituted C₂₋₆-alkenyl, hydroxy, C₁₋₆-alkoxy, C₂₋₆-alkenyloxy, carboxy, C₁₋₆-alkoxycarbonyl, C₁₋₆-alkylcarbonyl, formyl, amino, mono- and di(C₁₋₆-alkyl)amino, carbamoyl, mono- and di(C₁₋₆-alkyl)-amino-carbonyl, C₁₋₆-alkyl-carbonylamino, carbamido, azido, C₁₋₆-alkanoyloxy, sulphono, sulphanyl, C₁₋₆-alkylthio, DNA intercalators, photochemically active groups, thermochemically active groups, chelating groups, reporter groups, and ligands, and halogen, where two geminal substituents together may designate oxo;

and basic salts and acid addition salts thereof.

28 168. (amended) An oligomer of claim 167 wherein one R^{*} is selected from hydrogen, hydroxy, optionally substituted C₁₋₆-alkoxy, optionally substituted C₁₋₆-alkyl, DNA intercalators, photochemically active groups, thermochemically active groups, chelating groups, reporter groups, and ligands, and any remaining substituents R^{*} are hydrogen.

29 169. (amended) An oligomer of claim 167 wherein the biradical is selected from $-O-$ or $-(CH_2)_{0-1}-O-(CH_2)_{1-3}-$.

30 170. (amended) An oligomer of claim 167 wherein B is selected from nucleobases.

31 171. (amended) 30 An oligomer of claim 170 wherein the oligomer comprises at least one LNA nucleoside wherein B is selected from adenine and guanine and at least one LNA nucleoside wherein B is selected from thymine, cytosine and uracil.

32 172. (amended) 27 An oligomer of claim 167 wherein R² is selected from hydrogen, hydroxy and optionally substituted C₁₋₆-alkoxy, and R^{1*}, R³, R⁵, and R^{5*} designate hydrogen.

33 173. (amended) 1 An oligomer according to claim 141 wherein any internucleoside linkage of the one or more LNA nucleosides is selected from linkages consisting of 2 to 4 groups/atoms selected from -CH₂-, -O-, -S-, -NR^H-, >C=O, >C=NR^H, >C=S, -Si(R["])₂-, -SO-, -S(O)₂-, -P(O)₂-, -P(O,S)-, -P(S)₂-, -PO(R["])-, -PO(OCH₃)-, and -PO(NHR^H)-, where R^H is selected from hydrogen and C₁₋₄-alkyl, and R["] is selected from C₁₋₆-alkyl and phenyl.

E2 34 174. (amended) 33 An oligomer of claim 173 wherein any internucleoside linkage of the one or more LNA nucleosides is selected from -CH₂-CH₂-CH₂-, -CH₂-CO-CH₂-, -CH₂-CHOH-CH₂-, -O-CH₂-O-, -O-CH₂-CH₂-, -O-CH₂-CH=, -CH₂-CH₂-O-, -NR^H-CH₂-CH₂-, -CH₂-CH₂-NR^H-, -CH₂-NR^H-CH₂-, -O-CH₂-CH₂-NR^H-, -NR^H-CO-O-, -NR^H-CO-NR^H-, -NR^H-CS-NR^H-, -NR^H-C(=NR^H)-NR^H-, -NR^H-CO-CH₂-NR^H-, -O-CO-O-, -O-CO-CH₂-O-, -O-CH₂-CO-O-, -CH₂-CO-NR^H-, -O-CO-NR^H-, -NR^H-CO-CH₂-, -O-CH₂-CO-NR^H-, -O-CH₂-CH₂-NR^H-, -CH=N-O-, -CH₂-NR^H-O-, -CH₂-O-N=, -CH₂-O-NR^H-, -CO-NR^H-CH₂-, -CH₂-NR^H-O-, -CH₂-NR^H-CO-, -O-NR^H-CH₂-, -O-NR^H-, -O-CH₂-S-, -S-CH₂-O-, -CH₂-CH₂-S-, -O-CH₂-CH₂-S-, -S-CH₂-CH=, -S-CH₂-CH₂-, -S-CH₂-CH₂-O-, -S-CH₂-CH₂-S-, -CH₂-S-CH₂-, -CH₂-SO-CH₂-, -CH₂-SO₂-CH₂-, -O-SO-O-, -O-S(O)₂-O-, -O-S(O)₂-CH₂-, -O-S(O)₂-NR^H-, -NR^H-S(O)₂-CH₂-, -O-S(O)₂-CH₂-, -O-P(O)₂-O-, -O-P(O,S)-O-, -O-P(S)₂-O-, -S-P(O)₂-O-, -S-P(O,S)-O-, -S-P(S)₂-O-, -O-P(O)₂-S-, -O-P(O,S)-S-, -O-P(S)₂-S-, -S-P(O)₂-S-, -S-P(O,S)-S-, -S-P(S)₂-S-, -O-PO(R["])-O-, -O-PO(OCH₃)-O-, -O-PO(BH₃)-O-, -O-PO(NHR^N)-O-, -O-P(O)₂-NR^H-, -NR^H-P(O)₂-O-, -O-P(O,NR^H)-O-, and -O-Si(R["])₂-O-.

35 175. (amended) 37 An oligomer of claim 174 wherein any internucleoside linkage of the one or more LNA nucleosides is selected from $-\text{CH}_2-\text{CO}-\text{NR}^{\text{H}}-$, $-\text{CH}_2-\text{NR}^{\text{H}}-\text{O}-$, $-\text{S}-\text{CH}_2-\text{O}-$, $-\text{O}-\text{P}(\text{O})_2-\text{O}-$, $-\text{O}-\text{P}(\text{O},\text{S})-\text{O}-$, $-\text{O}-\text{P}(\text{S})_2-\text{O}-$, $-\text{NR}^{\text{H}}-\text{P}(\text{O})_2-\text{O}-$, $-\text{O}-\text{P}(\text{O},\text{NR}^{\text{H}})-\text{O}-$, $-\text{O}-\text{PO}(\text{R}'')-\text{O}-$, $-\text{O}-\text{PO}(\text{CH}_3)-\text{O}-$, and $-\text{O}-\text{PO}(\text{NHR}^{\text{N}})-\text{O}-$, where R^{H} is selected from hydrogen and C_{1-4} -alkyl, and R'' is selected from C_{1-6} -alkyl and phenyl.

Sub 15 E2 36 176. (amended) An oligomer of claim 141 wherein each of the substituents R^{1*} , R^2 , R^{2*} , R^3 , R^{3*} , R^{4*} , R^5 , R^{5*} , R^6 , R^{6*} , R^7 , and R^{7*} of the one or more LNA nucleosides, which are present and not involved in P, P^* or the biradical(s), is independently selected from hydrogen, optionally substituted C_{1-6} -alkyl, optionally substituted C_{2-6} -alkenyl, hydroxy, C_{1-6} -alkoxy, C_{2-6} -alkenyloxy, carboxy, C_{1-6} -alkoxycarbonyl, C_{1-6} -alkylcarbonyl, formyl, amino, mono- and di(C_{1-6} -alkyl)amino, carbamoyl, mono- and di(C_{1-6} -alkyl)-amino-carbonyl, C_{1-6} -alkyl-carbonylamino, carbamido, azido, C_{1-6} -alkanoyloxy, sulphonyl, sulphonyl, C_{1-6} -alkylthio, DNA intercalators, photochemically active groups, thermochemically active groups, chelating groups, reporter groups, and ligands, and halogen, where two geminal substituents together may designate oxo, and where $\text{R}^{\text{N*}}$, when present and not involved in a biradical, is selected from hydrogen and C_{1-4} -alkyl.

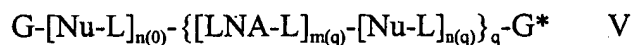
37 177. (amended) An oligomer of claim 141 wherein X is selected from $-\text{O}-$, $-\text{S}-$, and $-\text{NR}^{\text{N*}}-$, and each of the substituents R^{1*} , R^2 , R^{2*} , R^3 , R^{3*} , R^{4*} , R^5 , R^{5*} , R^6 , R^{6*} , R^7 , and R^{7*} of the LNA(s), which are present and not involved in P, P^* or the biradical(s), designate hydrogen.

38 178. (amended) An oligomer of claim 141 wherein P is a 5'-terminal group selected from hydrogen, hydroxy, optionally substituted C_{1-6} -alkyl, optionally substituted C_{1-6} -alkoxy, optionally substituted C_{1-6} -alkylcarbonyloxy, optionally substituted aryloxy, monophosphate, diphosphate, triphosphate, and $-\text{W}-\text{A}'$, wherein W is selected from $-\text{O}-$, $-\text{S}-$, and $-\text{N}(\text{R}^{\text{H}})-$ where R^{H} is selected from hydrogen and C_{1-6} -alkyl, and where A' is selected from DNA intercalators,

photochemically active groups, thermochemically active groups, chelating groups, reporter groups, and ligands.

39 179. (amended) An oligomer of claim 141 wherein P* is a 3'-terminal group selected from hydrogen, hydroxy, optionally substituted C₁₋₆-alkoxy, optionally substituted C₁₋₆-alkylcarbonyloxy, optionally substituted aryloxy, and -W-A', wherein W is selected from -O-, -S-, and -N(R^H)- where R^H is selected from hydrogen and C₁₋₆-alkyl, and where A' is selected from DNA intercalators, photochemically active groups, thermochemically active groups, chelating groups, reporter groups, and ligands.

E2 40 180. (amended) An oligomer of claim 141 wherein the oligomer corresponds to the following formula V:



wherein

q is 1-50;

each of n(0), ..., n(q) is independently 0-10000;

each of m(1), ..., m(q) is independently 1-10000;

with the proviso that the sum of n(0), ..., n(q) and m(1), ..., m(q) is 2-15000;

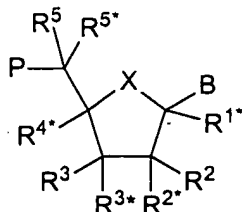
G designates a 5'-terminal group;

each Nu independently designates a nucleoside selected from naturally occurring nucleosides and nucleoside analogues;

each LNA independently designates a nucleoside analogue;

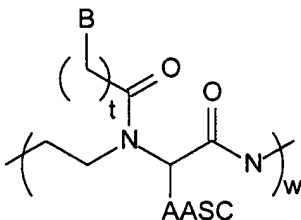
each L independently designates an internucleoside linkage between two groups selected from Nu and LNA, or L together with G* designates a 3'-terminal group; and

each LNA-L independently designates a nucleoside analogue of the general formula I:



wherein the substituents B, P, P*, R^{1*}, R², R^{2*}, R³, R^{4*}, R⁵, and R^{5*}, and X are as defined in claim 141.

181. (amended) An oligomer of claim 141 further comprising a PNA mono- or oligomer segment of the formula



wherein B is as defined above for the formula I, AASC designates hydrogen or an amino acid side chain, t is 1-5, and w is 1-50.

182. (amended) An oligomer of claim 141 which has an increased specificity towards complementary ssRNA or ssDNA compared to a corresponding reference oligonucleotide which does not contain any LNA units.

183. (amended) An oligomer of claim 141 which has an increased affinity towards complementary ssRNA or ssDNA compared to a corresponding reference oligonucleotide which does not contain any LNA units.

184. (amended) An oligomer of claim 141 which is capable of binding to a target sequence in a dsDNA or dsRNA molecule by of strand displacement or by triple helix formation.

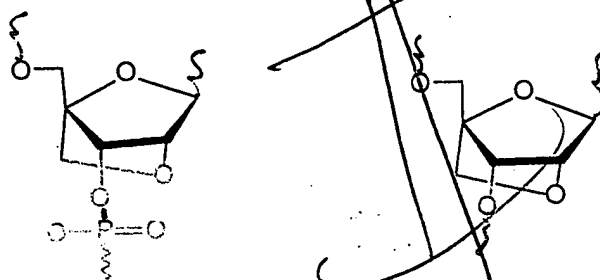
⁴⁵
~~185.~~ (amended) An oligomer of claim ~~141~~¹ which is more resistant to nucleases than a corresponding reference oligonucleotide which does not contain any LNA units.

E2
⁴⁶
~~186.~~ (amended) An oligomer according to claim ~~141~~¹ which has nucleic acid catalytic activity.

~~189.~~ (amended) A diagnostic or analysis kit comprising an oligonucleotide of claim
188.

E3
~~190.~~ (amended) A kit of claim 189 wherein the oligonucleotide is immobilized on a solid support.

⁴⁷
~~193.~~ (amended) An oligonucleotide comprising one or more of the following groups:



wherein the wavy lines indicates optional substitution.

SUB
10
E5
⁴⁸
~~195.~~ (amended) A diagnostic or analysis kit comprising an oligonucleotide of claim

⁴⁹
~~196.~~ (amended) A kit of claim ~~195~~⁴⁸ wherein the oligonucleotide is immobilized on a solid support.

⁵⁰
~~197~~. (amended) A diagnostic or analysis kit comprising a reaction body and one or more oligonucleotides of claim ~~141~~. /

⁵⁰
~~198~~. (amended) The kit of claim ~~197~~ wherein the one or more oligonucleotides are immobilized on the reaction body.

⁵²
~~199~~. (amended) A diagnostic or analysis kit comprising a reaction body and one or more oligonucleotides of claim ~~147~~. 7

ES ⁵²
~~200~~. (amended) The kit of claim ~~199~~ wherein the one or more oligonucleotides are immobilized on the reaction body.

⁵⁴
~~201~~. (amended) A diagnostic or analysis kit comprising a reaction body and one or more oligonucleotides of claim ~~157~~. 17

⁵⁴
~~202~~. (amended) The kit of claim ~~201~~ wherein the one or more oligonucleotides are immobilized on the reaction body.

⁵⁶
~~203~~. (amended) A diagnostic or analysis kit comprising a reaction body and one or more oligonucleotides of claim ~~166~~. 26

⁵⁶
~~204~~. (amended) The kit of claim ~~203~~ wherein the one or more oligonucleotides are immobilized on the reaction body.

⁵⁸
~~205~~. (amended) A diagnostic or analysis kit comprising a reaction body and one or more oligonucleotides of claim ~~167~~. 27